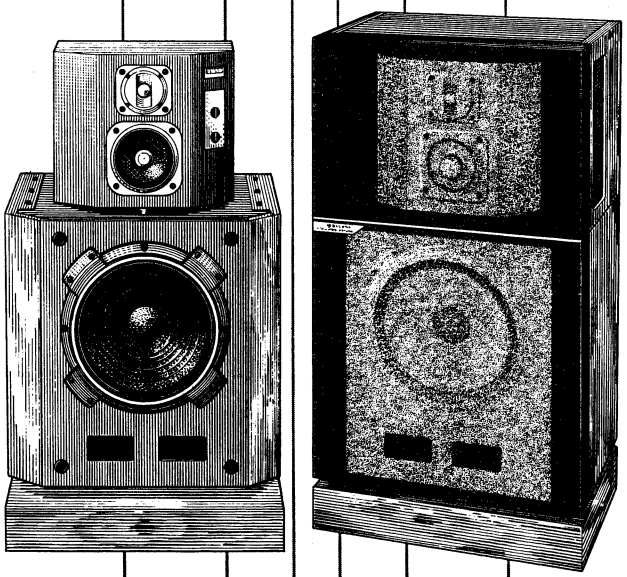
3 WAY 3 SPEAKER SYSTEM

LS-1900

INSTRUCTION MANUAL



KENWOOD

INTRODUCTION

The purpose of this manual is to acquaint you with the operating features of your new speaker. You will notice that in every detail of planning, engineering, styling, operating convenience, and adaptability, we have sought to anticipate your needs and desires.

We suggest that you read this manual carefully. Knowing how to set up your speaker to the best advantage will enhance your listening pleasure right from the start. You will also become aware of the ease with which you can adjust your speaker to meet your special requirements.

FOR YOUR RECORDS

Record the serial number, found on the back of the unit, in the spaces designated on the warranty card, and in the space provided below. Refer to the model and serial numbers whenever you call upon your Kenwood dealer for information or service on this product.

Model LS-1900 Serial number_____

UNPACKING

Examine the unit for any possibility of shipping damage. If your unit is damaged or fails to operate, notify your dealer immediately. If your unit was shipped to you directly, notify the shipping company without delay. Only the consignee (the person or company receiving the unit) can file a claim against the carrier for shipping damage.

We recommend that you retain the original carton and packing materials for use should you transport or ship the unit in the future.

INSTALLATION PRECAUTIONS

(a) Avoid locations subject to direct sunlight.
(b) Avoid high or low temperature extremes.
(c) Make sure power is off before making any system connections.

WARNING:
TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

FEATURES

- The low frequency driver has an Alnico magnet and a pot yoke, resulting in a uniform magnetic field and a low third harmonic distortion.
- A center support type 13 cm (5-1/8 inches) mid-frequency driver is used to improve power linearity and transient characteristics.
- The high frequency driver has an Alnico magnet and a pot yoke, making a magnet circuit with a uniform magnetic field.
- The low frequency enclosure and mid-and-high frequency enclosure are individually enclosed to prevent influence from mechanical vibration of the low frequency driver.
  The mid-and-high frequency enclosure can be rotated ±30 degrees horizontally for directional adjustment.
- The network coils are located to prevent mutual induction between coils.
- Multi-terminals are provided so that each unit can be directly driven.

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EXTERNAL VIEW

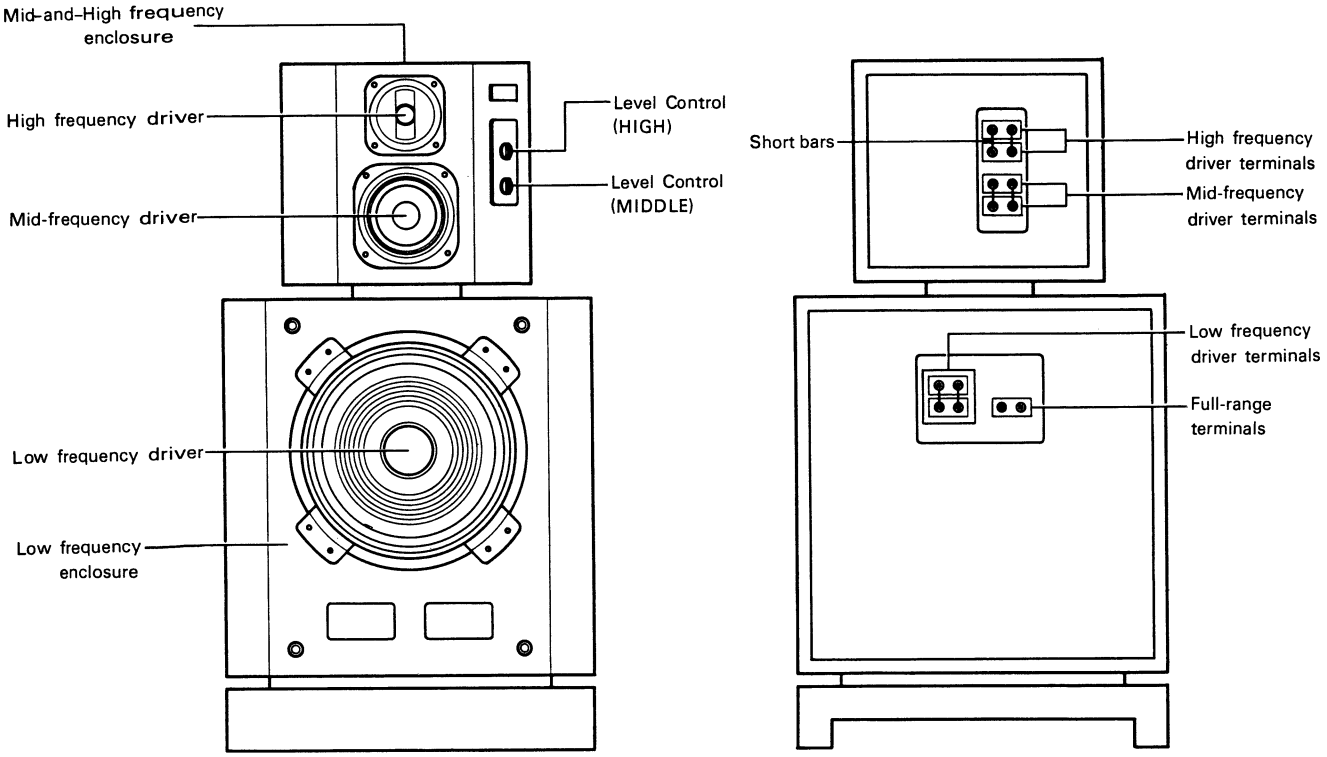
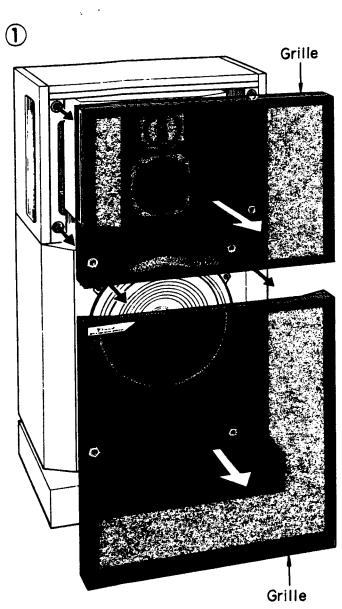
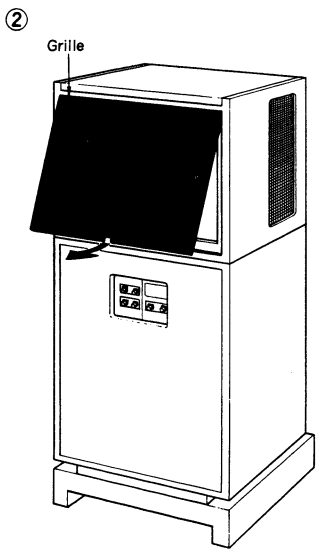


Fig. 1

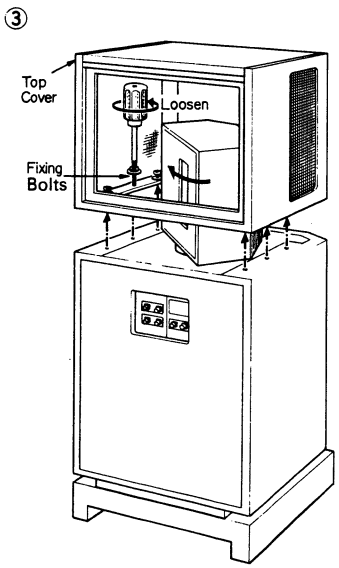
HOW TO REMOVE THE GRILLES AND TOP COVER



The grilles can be removed by pulling it towards you.



The grille can be removed by pulling it in the direction of the arrow.



To remove the top cover, rotate the mid-and-high frequency enclosure and loosen the fixing bolts (6 pieces). Tighten the Fixing bolts.

Fig. 2

SPEAKER LOCATION

The speaker works into the acoustic environment provided by your listening room. Room acoustics and speaker placement are important to peak performance.

Remember the following points when setting out the speaker system. The LS-1900 is designed to be placed directly on the floor. For the best stereophonic reproduction of music, place a speaker at a corner of the room, about 30 cm (12 inches) away from the wall.

Leave a distance of more than 2m (6 ft) between the left and right speakers, or stereophonic reproduction will deteriorate.
The system gives the best effect when the listener sits on a couch or low chair. The listening position should not be higher than the speaker system. The ideal position is equidistant from the speakers. The listening position should be 2m (6 ft) or more away from the speakers, and at least equal to the distance between them. See Fig. 3.

With the LS-1900, the best listening point can be easily obtained by rotating the mid-and-high frequency enclosure instead of moving the whole system. See Fig. 4.

The mid-and-high frequency enclosure rotates smoothly through ±30 degrees.

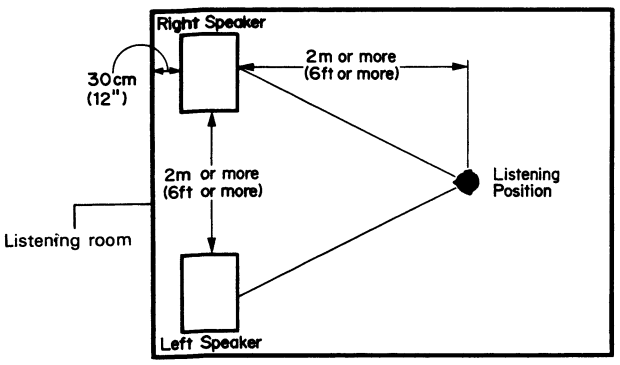


Fig. 3

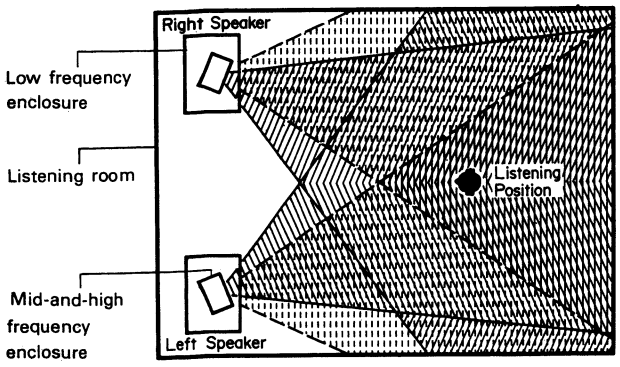


Fig. 4

SYSTEM CONNECTIONS

FULL-RANGE CONNECTIONS

Be sure to turn power off before connecting your speakers system to an amplifier.

Ascertain that the LOW, MIDDLE and HIGH (EXTERNAL NETWORK) input terminals are connected by short bars as shown in Fig. 5.

Connect the terminals (INTERNAL NETWORK) on the rear of each speaker enclosure to the corresponding speaker output terminals of the amplifier. Be sure to connect the ⊕ terminal of the amplifier to the ⊕ terminal of the speaker, and similarly connect ⊖ and ⊖ terminals. See Fig. 5.

This speaker system has a nominal impedance of 8 ohms, and will operate satisfactorily with an amplifier designed to drive 4 to 16-ohms speakers.

Perfect stereo reproduction is achieved when speakers are "phased" correctly (when the polarity marks are followed in making connections). Correct phasing means that the cones in both speakers move in the same direction in response to audio drive from the amplifier. If the speakers are out-of-phase, sound waves tend to cancel within the listening room. This effect is most noticeable for bass tones.

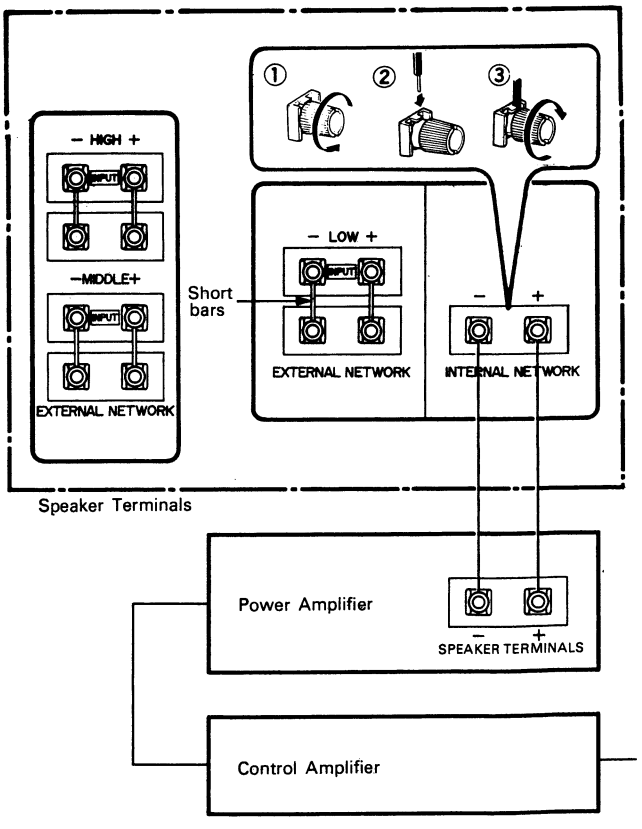


Fig. 5

MULTI-CHANNEL CONNECTIONS

In the multi-channel amplifier system, each speaker unit is separately driven by a power amplifier. Use three power amplifiers, one control amplifier and one electric cross-over network.

Remove the short bars attached to the LOW, MIDDLE and HIGH (EXTERNAL NETWORK) input terminals on the rear of the speaker system.

1. The electric cross-over network setting is as follows.
   When the cross-over network is 18dB/oct or 12dB/oct, the lower cross-over frequency must be between 400 ~ 800 Hz and the higher cross-over frequency between 5,000 ~ 8,000 Hz.
   When the cross-over network is 6dB/oct, the lower cross-over frequency must be between 500 ~ 800 Hz and the higher cross-over frequency between 8,000 ~ 10,000 Hz.
2. Connect the "LOW" input terminal of the speaker system to the low-range power amplifier, the "MIDDLE" input terminal to the mid-range power amplifier and the "HIGH" input terminal to the high-range power amplifier.
   When the cross-over network is 18dB/oct or 6dB/oct, connect all the ⊕ terminals of the speaker system to the corresponding ⊕ terminals of the power amplifier as shown in Fig. 6. When the cross-over network is 12dB/oct, only the mid-frequency driver may be connected out-of-phase as shown in Fig. 7.

Note:
Phase may vary according to room and placement conditions. If necessary, change the connection so that the most natural sound can be heard.

3. Attenuate the sound volume levels of the mid-frequency driver and the high frequency driver by 2 dB and 12 dB, respectively, by means of the volume controls of the cross-over network.
   The sound level of the mid-frequency driver and the high frequency driver are thereby made to equal that of the low frequency driver. Of course, you can alter the sound levels to suit your preference.

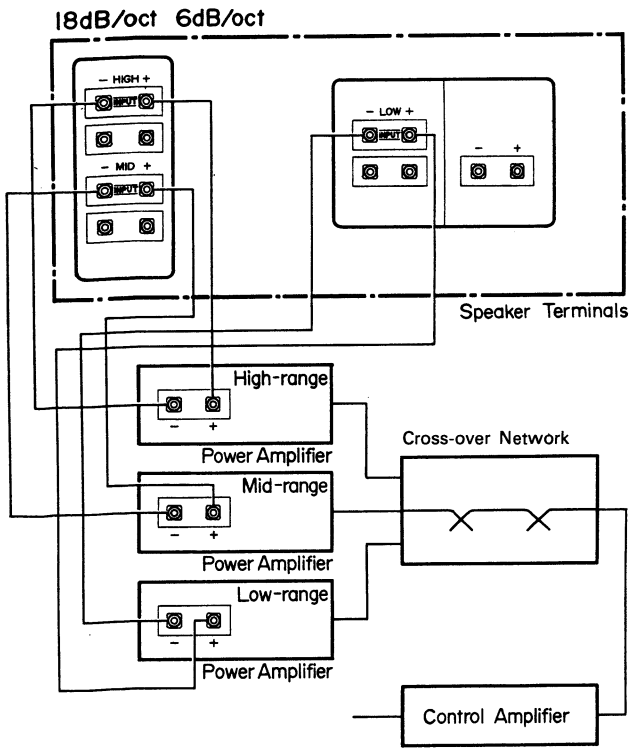


Fig. 6

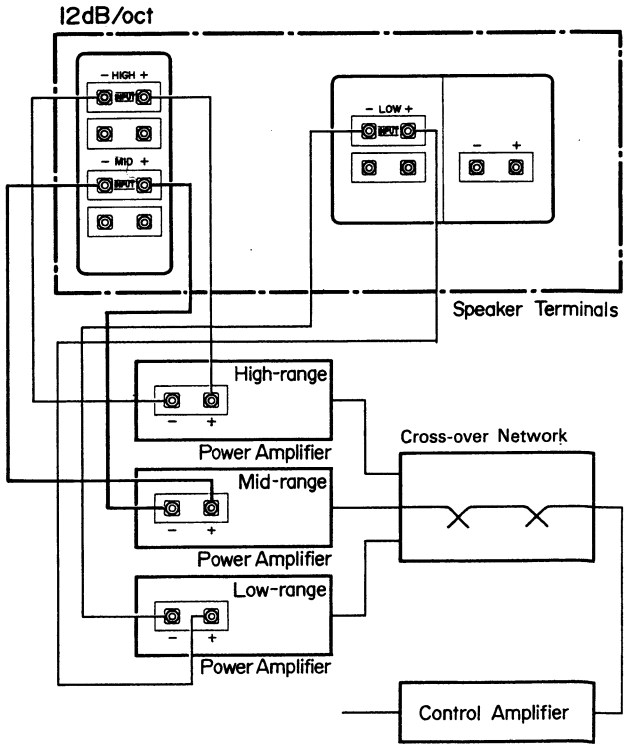


Fig. 7

LEVEL CONTROLS

HOW TO USE THE LEVEL CONTROLS

The LS-1900 provides level controls for the MIDDLE and HIGH audio range. They can be set to suit room acoustics as follows.

1. Remove the front panel cloth-covered grille by grasping at the top edges. Pull the grille forward to gain access to the controls. See Fig. 2-①.
2. Set your amplifier tone, loudness, low and high filters for flat response.

HIGH Level Control

"+2","+4" Positions — Increase high-range tone by 2 or 4 dB.

"0" Position — Adjusted to suit a flat frequency response for most average rooms.

"−2","−4" Positions — Attenuate high-range tone by 2 or 4 dB.

MIDDLE Level Control

"+1","+2" Positions — Increase mid-range tone by 1 or 2 dB.

"0" Position — Adjusted to suit a flat frequency response for most average rooms.

"−1","−2" Positions — Attenuate mid-range tone by 1 or 2 dB.

LEVEL CONTROLS

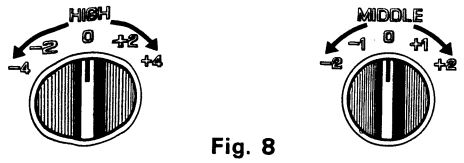


Fig. 8

ADJUSTMENT HINTS

The level controls are factory preset to the 0 dB settings to suit average room conditions. In rooms with short reverberation time, called "dead" rooms in acoustic parlance, treble tones tend to be emphasized. In that case, setting the HIGH level control to "−2" or "−4" dB will improve overall response.

On the other hand, so-called "live" rooms tend to boost base, and may benefit by setting the MIDDLE control to "+1" or "+2" dB and the HIGH control to "+2" or "+4" dB.

Keep in mind that the sound-absorbing qualities of a room rises when it is filled with people. Acoustically speaking, a "live" room tends to become a "dead" room in this case.

NOTES

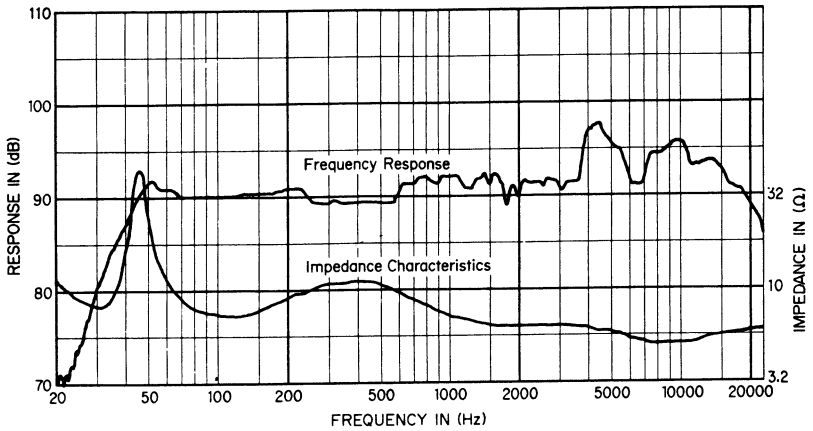
- The maximum input power capacity of this speaker is 170 watts. Do not operate the speaker with power exceeding this limitation, as speaker damage may result.
- When operating the switches on the amplifier, you may sometimes hear loud click noises from the speakers. If this noise is produced when the amplifier's volume level is at the maximum, it can cause damage to the speakers. Always turn the volume down before operating any of the amplifier's switches.
- When this speaker is connected to a multi-amplifier system, make sure that each speaker unit is connected to the correct amplifier output. If the "MIDDLE" or "HIGH" input terminals of the speaker system are connected to the low range power amplifier output terminals, the speaker unit may be damaged.

SPECIFICATIONS

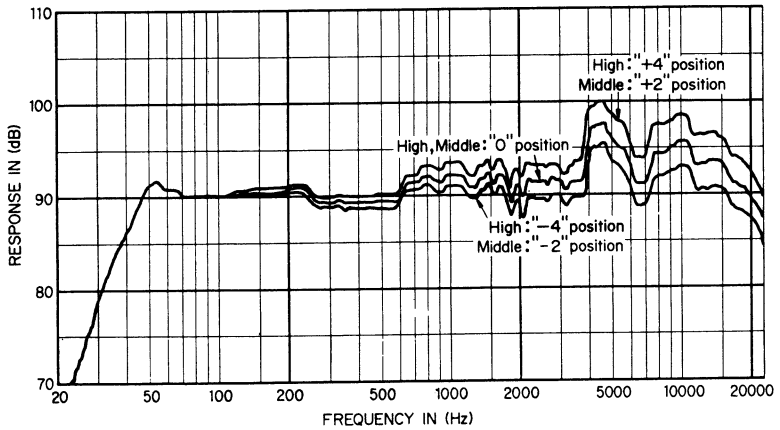
System	3-Way, 3-Speaker System
Mounted Drivers	
Low frequency driver	330 mm (13") Cone Type
Mid-frequency driver	130 mm (5-1/8") Cone Type
High frequency driver	Diffraction Horn Type
Enclosure	Bass-Reflex Type
Maximum Input Power	170 watts
Rated Input Power	115 watts
Sensitivity	92 dB/w at 1m
Frequency Response	30 Hz to 21,000 Hz
Cross-over Frequencies	600 Hz, 5,000 Hz
Impedance	8 ohms
Dimensions	W: 560 mm (22-2/32") H: 1,055 mm (41-17/32") D: 450 mm (17-23/32")
Weight	58.0 kg (127.9 lbs)
Additional Features	Step-down attenuator level controls for Mid (±2 dB) and High (±4 dB) frequencies
Enclosure Finish	Construction of the enclosure is particle board laminated with walnut veneer finish.

(Kenwood follows a policy of continuous advancements in development. For this reason specifications may be changed without notice.)

FREQUENCY RESPONSE AND IMPEDANCE CHARACTERISTICS



LEVEL CONTROL CHARACTERISTICS



CHARACTERISTICS EACH SPEAKER UNIT